Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

TITLE V (FINAL PERMIT) NO. V-99-026, REV. 2
WESTLAKE PVC
CALVERT CITY, KY 42029
AUGUST 1, 2003
JOSHUA J. HIGGINS, REVIEWER
PLANT I.D. # 21-157-00040
APPLICATION LOG # 55902

SOURCE DESCRIPTION:
The Westlake PVC Corporation is a synthetic organic chemical manufacturing industry (SOCMI) falling under SIC Group 28. Polyvinyl chloride (PVC) is produced at this facility by polymerization of vinyl chloride monomer (VCM) in batch reactors. Following polymerization, the PVC slurry is sent to steam stripping columns to separate the PVC from unreacted VCM which is recycled back into the process. Following the stripping operation, the PVC resin is dried, screened and finally sent to one or more of 16 PVC storage silos. Several grades of PVC are produced at this facility and the finished product is shipped out of the plant by truck and rail transport. The facility is currently permitted for a maximum production rate of 750,000 tons of PVC per year.

CREDIBLE EVIDENCE:
This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.

APPLICATION COMMENTS:
I. Initial Issuance, V-99-026, Log # F851
II. Significant Revision, V-99-026 Revision 1, Log # 54216 / 54030
III. Significant Revision, V-99-026 Revision 2, Log # 55030 / 55611
IV. Administrative Amendment, V-99-026 Revision 2, Log # 55902

COMMENTS:

a. Type of control and efficiency:
Several control devices are used through the plant:
   i. Process equipment (reactors, strippers, recovery tanks, etc) - Most of the process equipment is controlled by 2 thermal oxidizers which are used to reduce the concentration of vinyl chloride in the exhaust stream to less than 10 ppm as required by 40 CFR 61 Subpart F (Vinyl Chloride NESHAP). A wet scrubber is used to reduce HCl emissions from the oxidizer exhaust.
   ii. PVC Dryers - All dryers at the plant are equipped with multiple-cyclones for control of particulate emissions. Additionally, the newest four dryers each have a scrubber following the cyclone.
   iii. PVC Storage Silos - Each silo is equipped with a baghouse for control of particulate emissions.

b. Emission factors and their source:
Emissions have been estimated using a combination of AP-42 emission factors, stack test data, and material balance. See the "Calculations" section of the application for details.

c. Applicable regulations:
The following regulations apply to this facility:
   i. 401 KAR 59:015, *New indirect heat exchangers*, applies to Boilers #1, #2, and #3.
   ii. 401 KAR 60:005, which incorporates by reference federal regulation 40 CFR 60 Subpart Dc, *Standards of performance for small industrial-commercial-institutional steam generating units*, applies to Boilers #1, #2, and #3.
   iii. 401 KAR 57:002, which incorporates by reference federal regulation 40 CFR 61 Subpart F, *National emission standard for vinyl chloride*, applies to the entire PVC plant.
   iv. 401 KAR 59:010, *New process operations*, applies to each PVC dryer (except Rotary Dryer #2) and each PVC storage silo.
   v. 401 KAR 61:020, *Existing process operations*, applies to Rotary Dryer #2 (EP 01).
   vi. 401 KAR 63:010, *Fugitive emissions*, applies to the PVC railcar loading operations and the cooling tower.

EMISSION AND OPERATING CAPS DESCRIPTION:

This facility is currently permitted under the following two permits:

a. Permit F-94-017 (Revision 2) - Originally issued on March 3,1 1995, this permit authorized expansion of the Westlake PVC plant from 182,000 tons of PVC per year to 300,000 tons PVC per year. Several new emission units were added to the plant during this expansion. Two minor revisions were subsequently made to this permit.
b. Permit F-96-023 (Revision 1) - Originally issued on September 29, 1996, this permit authorized expansion of the Westlake PVC plant from 300,000 tons of PVC per year to 750,000 tons PVC per year. This expansion is not complete as of the date of issuance of this permit, as a result only

   some of the new emission units authorized by this permit have been added to the plant. One minor revision was subsequently made to this permit.

At the time of issuance of these permits, the facility was still classified as a minor source. In both cases, regulatory allowables for particulate matter, sulfur dioxide, and vinyl chloride were scaled down below the maximum allowable emission rates specified by regulation. Consequently, these permits were classified as "federally-enforceable synthetic minor permits".

All "synthetic minor" permit requirements contained in these permits have been carried over to the Title V permit. Specifically, these are:

i. For Boilers #1, #2, and #3, a lower allowable emission rate for sulfur dioxide and particulate matter than that specified by 401 KAR 59:015, *New indirect heat exchangers*.
ii. Restriction on fuel usage rates at Boilers #1, #2, and #3.
iii. For each dryer, a lower allowable emission rate for particulate matter than that specified by 401 KAR 59:010, *New process operations*.
iv. For each PVC storage silo, a lower allowable emission rate for particulate matter than that specified by 401 KAR 59:010, *New process operations*.
v. PVC production limited to 750,000 tons per year.
vi. The vinyl chloride NESHAP (40 CFR 61 Subpart F) limits the weighted average residual vinyl chloride concentration in all grades of PVC to no more than 400 ppm (daily average), measured immediately after the stripping operation. Since vinyl chloride and VOC emissions are a function of the residual vinyl chloride concentration and the PVC production rate, the annual average residual vinyl chloride concentration in all grades of PVC is limited to 40 ppm to limit emissions of vinyl chloride and VOC.

OPERATIONAL FLEXIBILITY:

The expansion authorized by Permit F-96-023 (Revision 1) has not been completed as of the date of issuance of this permit during to prevailing economic conditions. Specifically, the three stripping columns authorized by that permit have not been installed. As a result, Westlake currently does not have adequate stripping capacity to reduce the annual average residual vinyl chloride concentration in all grades of PVC to 40 ppm or less as specified above.

In order to limit emissions of vinyl chloride and VOC to the levels set in Permit F-96-023 (Revision 1), an intermediate limit of 105 ppm has been established for the annual average residual vinyl chloride concentration in conjunction with an intermediate PVC production limit of 400,000. These two operating restrictions (VCM concentration and PVC production) together limit emissions of vinyl chloride and VOC to the same level as the 40 ppm and 750,000 tpy combination.

The permit contains the following language:

a. Prior to completion of construction of the 3 new PVC stripping columns authorized by this permit, the dry PVC production rate shall not exceed 400,000 tons during any consecutive 12-month period and the weighted average residual vinyl chloride concentration in all grades of polyvinyl chloride resins processed through the existing stripping columns, measured

   immediately after the stripping operation is completed and prior to entering any of the dryers, may not exceed 105 ppm as a twelve (12) month average [Permit F-96-023 (Revision 1)].
b. Upon completion of construction of the 3 new PVC stripping columns authorized by this permit, the dry PVC production rate maybe increased up to 750,000 tons during any consecutive 12-month period and the weighted average residual vinyl chloride concentration in all grades of polyvinyl chloride resins processed through the stripping operation, measured immediately after the stripping operation is completed and prior to entering any of the dryers may not exceed 40 ppm as a twelve (12) month average [Permit F-96-023 (Revision 1)].

PUBLIC AND U.S. EPA REVIEW:

On January 5, 2000, the public notice on availability of the draft/proposed permit and supporting material for comments by persons affected by the plant was published in the *Lake News* in Calvert City, Kentucky. The public comment period expired 30 days from the date of publication. During this

time no comments were received from the general public.

Comments were received from Westlake on February 7, 2000. Attachment A to Section I to this document lists the comments received and the division's response to each comment. Minor changes were made to the permit as a result of the comments received, however, in no case were any emissions standards, or any monitoring, recordkeeping or reporting requirements relaxed. Please see Attachment A for a detailed explanation of the changes made to the permit.

Since comments were received from the facility during the public comment period, the permit now being issued is a proposed permit. U.S. EPA has 45 days from the date of the issuance of the proposed permit to comment on it. If U.S. EPA files no objection during this period, the proposed permit shall become the final permit.

Attachment A to Section I
Source Comments, Log # F851

Comments from Westlake PVC Corporation (Received February 7, 2000)

1. Permit Application Summary Form - In reviewing the table of actual and potential emissions, we find the need for a correction in the potential emissions of methanol. In a review of the current MSDS sheets for the insignificant source of these emissions, we have found that the Polyvic additives that contributes to these emissions may contain up to 4 percent methanol rather than the 2 percent reported in the older formulation. Based on the mix that is likely to be used for our different grades of PVC resin and result in maximum emissions, we estimate the potential emissions to be 0.15 tons per year. We request that this correction be made in the final determination and the Division's permit file records for this affected facility.

   Division Response - The division concurs with this comment and the Emissions Inventory System will be updated to reflect the revised emissions rates of methanol. No changes are necessary to the permit since no new applicable regulations are triggered as a result of the revised calculations. It is division policy not to re-issue Permit Application Summary Forms with the proposed permit, hence no changes are necessary to that form with this action.

2. Page 3 of 45, Section B, Boilers, Emission Points 15 (15) and 22 (22) - We request that the annual natural gas/process gas limitations in Condition 1.a. for both of the Boiler #1 and Boiler #2 be revised from 649,077,500 cubic feet/year to 881,045,750 cubic feet per year if only gas is used. We will not exceed the maximum amount of #2 fuel oil allowed by Condition 1b.

   Division Response - The division concurs with this comment. At the time these boilers were permitted, annual limits on natural gas usage were added to enhance compliance with the synthetic minor limits which these boilers were subject to. The division has now concluded that compliance with these synthetic minor limits is best determined through actual emissions data. Therefore, the division has eliminated the annual natural gas usage limit from the permit. Compliance with the true underlying standards (namely, the synthetic minor limits for NOx, SO_2, and particulate matter) will now be determined directly through actual emissions data. This will be accomplished through a revised compliance demonstration method for the emission limits. Item a. under **2. Emission Limits** (**Compliance Demonstration Method**) has been revised to the following form.

   "**Compliance Demonstration Method:** (For all three boilers)
   Mass Emission Limits:
   For particulate matter, NOx, and SO_2:
   a. For each boiler, burning only the fuels specified in this permit shall be deemed to be compliance with the applicable ~~emission~~ performance standards (lb/mmBTU limits).
   b. For each boiler, compliance with the annual particulate matter, NOx, and SO_2 emission limits (tons per year) shall be determined through the following formula:

   Actual Annual Emissions of $PM/PM_{10}/NOx/SO_2$ (tpy) =
   { [Amount of natural gas used per year x Emission factor for $PM/PM_{10}/NOx/SO_2$ (in lbs/ft^3 of natural gas)] + [Amount of fuel oil used per year x Emission factor for $PM/PM_{10}/NOx/SO_2$ (in lbs/gallon of fuel oil)] } / 2000 (lb/ton)

   The permittee shall calculate and maintain records of the monthly emissions of $PM/PM_{10}/NOx/SO_2$ and the 12-month rolling total of emissions for each pollutant."

(*Comment 2 continued*) If lesser amounts of oil are used than the maximum permitted, we request that the limits for oil and natural gas be determined by the formula:

> Natural or process gas used in cubic feet/year X emission factor for gas in tons NOx / cubic feet + Oil used in gallons per year X emission factor for oil in tons NOx/gallon = 19.95 tons/year.

We would use the emission factor from the last stack test for the gas and the AP-42 emission factor for fuel oil in this equation. Owing to the increased supplies of natural gas, we find that the possibility of curtailment is much reduced and actual oil usage only consists of an annual testing of the system readiness prior to the Winter heating season. The additional gas usage will provide greater flexibility to plant boiler operations.

Division Response - The division does not concur with this comment. The division agrees that the natural gas usage rate was originally limited to enhance compliance with the underlying standards (namely, the synthetic minor limits for NOx, SO_2, and particulate matter). With this permit action the division has determined that compliance with those emission limits is better determined through direct compilation of actual emission data. To this end, the division has eliminated the annual limit on natural gas usage from the permit and added a compliance demonstration method requirement to compile actual emissions data (see response to first part of Comment 2).

However, the division cautions Westlake against using natural gas in excess of that determined by the maximum rated capacity of Boilers #1 and #2 (98.5 mmBTU/hr) regardless of whether fuel oil is used during any 12-month period or not. Based on a heat capacity of 1021 BTU/ft^3, this works out to be 881,045,760 ft^3/year. The boilers are currently rated at capacities just below the trigger levels of 40 CFR 60 Subpart Db (100 mmBTU/hr). Using natural gas in excess of 881,045,760 ft^3/year at any boiler might imply that the maximum rated capacity of the boiler has exceeded 100 mmBTU/hr without complying with the requirements of 40 CFR 60 Subpart Db. Therefore, the changes requested by Westlake with this comment are denied. No changes were made to the permit as a result.

3. Page 3 of 45, Section B, Emission Points 15 (15) and 22 (22) - In conjunction with the operational flexibility requested under Comment 2 above, it is requested that the nitrogen oxide limits for Boilers #1 and #2 in Condition 2a, iii be both revised downwards from the 0.0577 lbs/mmBTU to 0.0462 lb/mmBTU. The performance test conducted in August 1998 that was witnessed by the KDAQ indicated an emission rate of 0.0363 lbs NOx/mmBTU for the low-NOx burner equipped units in these boilers. Westlake will accept a reduced hourly emission limit for the pollutant while staying below the annual NOx limit of 19.95 tons per year contained in Condition 2.c.iii. for Boiler #1 and #2, established as a synthetic minor limit in Permit F-94-017 (Revision 2).

   Division Response - The division concurs with this comment. The NOx performance limit for Boilers #1 and #2 has been revised downwards from 0.0577 lbs/mmBTU to 0.462 lb/mmBTU.

4. Page 11 of 45, Section B, Process Equipment (Thermal Oxidizers) Emission Point 09 (09) - In condition 7, for each wet scrubber following the thermal oxidizers, under Subsection a., we request that the word “fan” be replaced by “scrubber’ since a packed-bed scrubber may be used in place of a wet-fan-type scrubber. This will allow a higher control efficiency device to be used.

   Division Response - The division concurs with this comment. The requested change has been

made to the permit since it does not relax any applicable emission standard or any monitoring, recordkeeping or reporting requirement.

5. Page 14 of 45, Section B, Pipeline Equipment, Emission Point 20 (20) - In Condition 6, for valves, it is requested that the requirements of 40 CFR 61.65 (b)8(ii) be included with 40 CFR 61.243-1. We request that "and 40 CFR 61.65(b)8(ii)" be inserted after "40 CFR 61.243-1" as the alternate emission standard. This will allow Westlake PVC to continue the current leak detection and repair program under 40 CFR 61.243-1, as implemented under the reduced monitoring frequency allowed by the past demonstration of good maintenance and less than 2% leaking valve rate through annual inspections. Under the regulations, Westlake has been able to demonstrate the applicability of the alternate monitoring frequency, including reporting requirements.

   Division Response - The division concurs with this comment. The requested change has been made to the permit since it does not relax any applicable emission standard or any monitoring, recordkeeping or reporting requirement.

6. Page 25 of 45, Section B, PVC Storage Silos, Emission Point 03 (03) - Under the Compliance Demonstration Method, we request deletion of subsection a. Mass Emission Standard which requires that the actual PM emission rate to be calculated using an emission factor observed during the last stack test. The baghouses provided on the dry PVC resin silos cannot be tested by reference stack test protocols. The units are positive pressure bin vents that do not have a stack or fan but passively filter the dust from the conveying air (1420 scfm maximum based on blower capacity), allowing the filtered air to leave the bin vent in intermittent fugitive fashion from the top opening based on when material is conveyed to each silo. Reference Method 5 is not applicable nor is the air flow likely to exist over the entire period necessary to perform a reference method test due to the intermittent loading as needed. The assurance of compliance with the particulate emission limitation in the permit (0.15 lbs/hr) may be demonstrated through visual observation of each bin vent daily while in operation. We request that this be considered the compliance demonstration method with appropriate additions to the monitoring and recordkeeping requirements.

   Engineering analyses also support this approach as long as regular preventive maintenance and daily observation indicate normal operation. For fabric filters with no visible emissions, engineering, experience and testing has indicated that a mass emission rate below 0.005 grains per dscf. Based on a conservative assumption of double this rate (0.01 grains per dscf), a common manufacturers warranty for fabric filter units, the silo emission rate would be 1420 dscf x 60 min/hr x 0.01 gr/dscf/7000 gr/lb or 0.12 lbs per hour, below the allowable emission rate of 0.15 lbs/hr. Since the silos are only loaded intermittently, with daily observations of visible emissions and prompt maintenance, records of the daily observation of the bin vent visible emissions can adequately demonstrate compliance with the mass emission limits. Compliance with annual limits can also be demonstrated based on the Specific Monitoring Requirements of Condition 4b and Specific Recordkeeping requirements under Condition 5b.

   Division Response - The division concurs with this comment. Given the technical infeasibility of performing a stack test on the Storage Silos, the Compliance Demonstration Method for the Mass Emission Limits has been changed. Previously, a daily visible observation was required only under malfunction conditions. With this permit action, the permittee is now required to monitor and maintain records of the visible emissions from the silo stacks on a daily basis. Since visible emissions are closely tied with particulate mass emissions, the division has determined that this method of compliance demonstration is equivalent to that previously proposed and does not represent a relaxation of the underlying emission standard.

7. Page 26 of 45, Section B, PVC Storage Silos, Emission Point 03(03) - Based on the reasons stated above in Comment 6, we also request that the stack testing requirement under Condition 3a and 3b be deleted as impractical for the positive pressure bin vent control devices used on the silos.

   Division Response - The division concurs with this comment. Based on the changes to the permit documented in the division response to Comment 6, the particulate matter testing requirement has been deleted.

8. Page 26 of 45, Section B, PVC Storage Silos, Emission Point 03(03) -We request that Condition 4a and 5a require monitoring and recordkeeping of the throughput of dry PVC for each silo rather than the dry PVC amount loaded. We are able to determine the amount loaded out but find it impractical to determine the amount loaded in due to the continuous conveyance by pneumatic means from the dryers to the silo. Since the amount loaded out will equal the amount blown in, we believe this will provide the monitoring and recordkeeping for demonstrating compliance.

   Division Response - The division concurs with this comment. The requested change has been made to the permit since it does not relax any applicable emission standard or any monitoring, recordkeeping or reporting requirement.

9. Page 28 of 45, Section B, PVC Railcar Loading, Emission Point 06(06) - We request that Condition 2c. requiring a dust collection system in addition to the heavy curtains in Condition 2a. and the wet suppression system Condition 2b. be deleted. The conditions under 2a. and 2b. ensure compliance with the opacity and reasonable precaution requirements of 401 KAR 63:010. We are investigating future improvements that will reduce labor and reduce dust generation. These may not necessarily involve dust collection but rather, dust prevention. Therefore, in order to allow such measures to be used, we request that 2c. be replaced with the wording "The permittee may use any other methods to reduce dust from the loading operation if shown to the Division's satisfaction as being equivalent to the above".

   Division Response - The division concurs with this comment. The requested change has been made to the permit since it does not relax any applicable emission standard or any monitoring, recordkeeping or reporting requirement.

10. Page 42 of 45, Section G - In Condition (d) 1, we request that the pipeline equipment reference in Emission Point 20 but associated with the units to be constructed be specifically shown by adding "EP20 - Pipeline Equipment associated with EP03, 09, 34, 35, 52, 44, 45, 53, 54." This will ensure that the requirements for EP-20 apply to these units after construction.

    Division Response - The division concurs with this comment. The requested change has been made to the permit since it does not relax any applicable emission standard or any monitoring, recordkeeping or reporting requirement.

11. Page 43 of 45, Section G - In Condition (d) 6e, we request addition of the following wording "If the EP# 34-36 dryers are identical and operate under similar parametric conditions as the EP#33 dryer, the Division may allow the compliance demonstration stack test for EP# 33 to be used for demonstrating compliance with the mass emission limit".

    Division Response - The division concurs that testing for any one of the new dryers is sufficient provided that the dryers are identical and will operate under similar conditions.

COMMENTS:

Westlake PVC had previously accepted a synthetic minor condition for a project that included two boilers and a No. 2 fuel oil tank. The boilers were to use natural gas as a primary fuel and No. 2 fuel oil as a secondary fuel. Recent economical trends has prompted Westlake to consider using an ethylene fuel oil combined with natural gas in boiler #2 that contains dual-fired jets. This removes the previous synthetic minor limit and triggers a PSD review. Only NO_x has the potential to emit above the significant impact level. The PSD review included significant impact level analysis and long-range, long-term modeling on Class I areas. The modeling demonstrates that there would be no impact on human health or the environment.

The PSD application was received on October 15, 2001. A stack test will be required to demonstrate compliance with the NO_x and particulate matter requirements. This permit is being issued as a combined PSD and Revised Title V permit.

Applicable Regulations

401 KAR 51:017 (40 CFR 52.21), Prevention of Significant Deterioration of Air Quality.
401 KAR 59:015 New Indirect Heat Exchangers.
40 CFR 60 Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.

PSD REVIEW:

Westlake PVC is considered one of the 28 designated industrial source categories with a PSD threshold emission limit of 100 tons per year (TPY) for any criteria pollutant. The project, when first proposed, was given a synthetic minor limit to avoid PSD review. After some consideration, Westlake has requested to lift the synthetic minor for one boiler (#2) and proceed with a PSD review. Since both boilers were part of an initial project the potential emissions from both boilers must be considered for PSD review.

Westlake proposes to burn an ethylene fuel oil simultaneously with natural gas using dual-fire jets at proportions described in the permit. After evaluating the increase in potential to emit criteria pollutants, Westlake PVC has determined that only the increase in NO_x emissions will trigger a significant increase pursuant to 401 KAR 51:017, Prevention of Significant Deterioration. A PSD review was performed which included the following:

a. Demonstration of the application of Best Available Control Technology (BACT).
b. Demonstration of compliance with each applicable emission limitation under Title 401 KAR Chapters 50 to 63 and each applicable emission standard and standard of performance under 40 CFR 60 and 61.
c. Air quality impact analysis
d. Class I area(s) impact analysis
e. Projected growth analysis.
f. Analysis of the effects on soils, vegetation, and visibility.

BACT Analysis

For the BACT analysis, the EPA's RACT/BACT/LAER Information System (BLIS) was searched to determine commonly used technology for controlling NO_x formation. The analysis verified that Westlake must maintain low NO_x-burners with flue gas recirculation within Boiler #2. Two other control technologies, selective catalytic reduction and selective non-catalytic reduction,

were considered for BACT but were not cost-effective and were eliminated as possible control technologies.

Air Quality Impact Analysis/Screening

The ambient air quality impact of the proposed modification was assessed by performing dispersion modeling analyses using the U.S. EPA's Industrial Source Complex Short-Term (ISCST3) model and software provided by BREEZE. The analysis and screening procedure included a Good Engineering Practice (GEP) stack height analysis with building downwash in cases where the stack height was below GEP. A Cartesian grid with 100 meter spacing was used for the receptor grid network and surface weather observations from Paducah, KY, were used as the meteorological data. Marshall county is designated as Class II for PSD increments.

The PSD increment for NO_x in a Class II area, such as Marshall County, is 25 $\mu g/m^3$ and the significant impact level (SIL) is 1 $\mu g/m^3$. The screening analysis indicates that the impact level is 1.8 $\mu g/m^3$ which is above the SIL meaning that compliance with the PSD increment and NAAQS is required for this criteria pollutant. A 20-D analysis was performed to establish a list of sources and the impact level that is pertinent to Westlake PVC. Since PSD has been triggered for this county in the past, all minor sources were also considered for impact analysis. Assuming a background concentrations of 24 $\mu g/m^3$, the resulting primary and secondary maximum predicted NO_x overall impact was 63.7 $\mu g/m^3$ which is below the NAAQS for NO_x which is 100 $\mu g/m^3$.

Additional Air Quality Impact Analysis

Additional analyses were performed to determine if any adverse health effects or long range impacts on Class I areas were possible. The conclusion from Westlake PVC is that there are no adverse health effects on plant vegetation or human health since the increase in NO_x concentrations is small and does not appreciably add to current levels. Using a CALPUFF Tier 2 analysis, Westlake has determined that there is no impact on Class I areas (Mammoth Caves and Mingo National Wildlife Area) indicating that emissions from this project would not adversely impact regional haze at either location.

Emission Source and Limits	**Pollutant**	**Em. Factor (lb/SCC unit)**	**Reference Source**	**PTE (tons/year)**
Boiler #1 (Nat. Gas)	CO	84	AP-42	37.0
881 SCC/yr	NO_2	36.8	Vendor	16.2
(SCC unit: $mmft^3$)	PM	7.6	AP-42	3.4
	SO_2	0.6	AP-42	0.3
	VOC	5.5	AP-42	2.4
Boiler #1 (Oil)	CO	5.0	AP-42	1.1
433 SCC/yr	NO_2	17.6	Vendor	3.8
(SCC unit: 10^3 gal)	PM	2.0	AP-42	0.4
	SO_2	7.72	AP-42	1.7
	VOC	0.2	AP-42	0.04
Boiler #2 (Nat. Gas)	CO	132	Vendor	16.8
255 $mmft^3$/yr	NO_2	46.0	Vendor	5.9
(SCC unit: $mmft^3$)	PM	7.6	AP-42	1.0
	SO_2	0.6	AP-42	0.1
	VOC	5.5	AP-42	0.7
Boiler #2 (Oil)	CO	18.7	Vendor	41.3

4411.1 SCC/yr	NO_2	15.3	Vendor	33.7
(SCC unit: 10^3 gal)	PM	2.0	AP-42	4.4
	SO_2	7.7	AP-42	17.0
	VOC	0.2	AP-42	0.4
Increase for the	**CO**			**96.2**
Whole Project	**NO_2**			**59.6**
Log B903 and	**PM**			**9.2**
# 54216	**SO_2**			**19.0**
	VOC			**3.6**

EMISSION AND OPERATING CAPS DESCRIPTION:

The emissions calculated by Westlake PVC and URS differ slightly for several reasons. The CO emission rate is different because URS used the emission factor 37 lb/SCC unit. Their intention was to use the emission factor described in AP-42, suggesting that their value was in error. Using the AP-42 emission factor for CO shows an increase in PTE by 15 tons per year above what Westlake PVC quoted in their application.

The remaining criteria pollutant PTE calculations by URS were also incorrect. Westlake has chosen to take a limit on the amount of natural gas and fuel oil to be burned in Boiler #1. The limit on natural gas is 649 million cubic feet per year. A 979 Btu/cubic foot heat content for natural gas and a 98.5 mmBtu/hr heat input results in only 6450 hours per year of operation on natural gas. For fuel oil, Boiler #1 is physically limited to burning only 71 mmBtu/hr. Fuel oil has a 141,000 Btu/ gallon heat content and is limited to 433,000 gallons per year which results in only 860 hours of operation on fuel oil per year. Using these limits, the calculated PTE emissions were lower than those determined by URS and Westlake PVC.

The Sulfur content in the ethylene fuel oil was not well described in the Westlake PVC PSD application. The ethylene fuel oil is a co-product from a propane cracking operation conducted by Westlake CA&O (21-157-00039) and has similar properties to fuel oil #2 except that it has low sulfur and nitrogen content. Westlake is required to test the fuel oil being burned for sulfur content.

Westlake is requesting permission to operate the #2 boiler using natural gas at 28.5 mmBtu/hr (255 $mmft^3$/yr) and ethylene oil for 70 mmBtu/hr (4411 Kgallons/yr) as primary fuel. The No.2 fuel oil can be used as a secondary fuel source or as a replacement to the Ethylene fuel oil. In the event that the #2 boiler becomes inoperable, Westlake requests that the control devices (dual-fire jets) from the #2 boiler be placed in the #1 boiler and the operating conditions for the #2 boilers are then adopted for the #1 boiler.

The operating conditions and pollutant potential to emit (PTE) described in the table above are the permit limits for Westlake for the two boilers. The initial permit, V-99-026, contained Synthetic Minor limits in the Operating and Emissions Limitations sections. Based on Westlake's PSD review, those synthetic minor limits were removed for Boilers #1 and #2 only. The emission limits then become only the allowables for PM, SO_2 and NO_x. The compliance demonstration method is mainly that only the fuel specified in the permit can be burned and the fuel usage must be monitored. Since the NO_x emissions results from a BACT analysis, the yearly emission of 60.13 tons per year is a BACT limit specified in the permit.

PERIODIC MONITORING:

Throughput for each fuel used and sulfur content of the fuel oils shall be monitored and recorded on a monthly basis for a 12-month rolling average. When fuel oil (Ethylene or No. 2) is

burned, the visible emissions shall be visually monitored on a daily basis so as not to exceed 20% opacity.

OPERATIONAL FLEXIBILITY:

Westlake has requested that in the event boiler #2 is down for repairs, the dual-fire fuel jets be moved to boiler #1 and allow for the burning of natural gas and ethylene fuel oil in the same proportions and operating conditions as stated for boiler #2.

PUBLIC AND U.S. EPA REVIEW:

On July 31, 2002 the public notice on availability of the draft permit and supporting material for comments by persons affected by the plant was published in The Lake News in Calvert City Kentucky. The public comment period ended on August 30, 2002 and U.S. EPA comments period forty five days after that. During this time no comments were received from the affected state or the US EPA. Comments were received from the company. These comments are incorporated in the final permit.

RESPONSE TO COMMENTS:

Westlake has provided the following comments (C) and are addressed with responses (R) (see submitted comments in permanent file for further details):

C The important issue from PSD permitting is that… operation of both boilers (can operate) over the full range of previously permitted scenarios as well as the new ethylene fuel oil/natural gas dual fuel schenario on any one boiler. We request that the annual natural gas/process gas limitations in Condition 1.a. for Boiler #1 be deleted so as to retain the curent Title V limitation of a maximum of 100,576 cubic feet/hour natural gaswhen only natural gas is used.

R The permit language has been changed to reflect the flexibility requested and the maximum allowed amount of natural gas usage provided natural or process gas are the sole fuel source.

C We request that the correct make (and model) of the existing boilers (Zurn Type 0) be shown (in the permit) rather than the Babcock and Wilcox unit.

R The permit language has been changed to reflect the correct model and make name of the existing boilers.

C At the end of Condition 1.c. Compliance Demonstration Method, please delete “or No. 2 Fuel Oil as primary fuel” since there is no requirement for reporting of standby fuel in a boiler in case of gas curtailmentexcept in the annual emissions inventory as long as the conditions of the permit are met regarding maximum hourly usage.

R The quoted statement above was removed from the permit conditions.

There are no comments from EPA.

Revised PVC Production Rate Limits and Emission Limits

Westlake PVC Corporation, located in Calvert City, Marshall County, Kentucky, has a Title V permit (V-99-026 Revision 1) which was issued in December 2002. Westlake has proposed to revise PVC production limits and emission limits. Permit F-96-023 (Revision 1) authorized an expansion of the PVC plant. Phased operating restrictions on PVC production and residual vinyl chloride concentration were imposed in order to limit the emissions of vinyl chloride and VOC both before and after expansion was complete. The permit also contained phased vinyl chloride emission limits. These phased restrictions and emissions limits are summarized in the Table 1.

The construction of the three stripping columns authorized by permit F-96-023 (Revision 1) is not complete. However, Westlake has determined that vinyl chloride concentration less than the current 105 PPM limit, and PVC production greater than 400,000 tons/ yr. limit, are possible. In order to provide flexibility and take advantage of lower vinyl chloride concentration the plant can achieve, Westlake is proposing the revised permit limits shown in the Table 1. The PVC production limits would increase, while the vinyl chloride concentration limit would decrease. No changes are proposed for the limits that will be effected, after the construction of the PVC stripping columns is complete.

The proposal for revised PVC limits will change the dry PVC production to 450,000 tons/ yr and emissions of residual vinyl concentration in resins (12-month average) to 90 PPM. The changing of synthetic minor condition from 400,000 tons/yr and 105 ppm to 450,000 tons/yr and 90 PPM is a significant revision as per 401 KAR 52:020 Section 16. The emissions from proposed revision is 40.5 tons/yr of vinyl chloride, which are less than previous emissions of 41.5 tons/yr.

This revision is also to incorporate back up diesel-powered air compressor for the carrier dryer. The diesel engine is rated at 500-hp output. There are no applicable requirements for this emission unit. The emissions for this are given in Table 2. Based on the emissions, this is listed as an insignificant activity.

Table 1
Proposed Revised Permit Limits for PVC Production

Parameter	**Current Title V Permit Limits**	**Proposed Revised Limits**
Prior to the construction of PVC stripping columns		
Dry PVC production (12-month rolling total)	400,000 tons/yr	450,000 tons/yr
Residual vinyl chloride concentrations in the resin	105 ppm	90 ppm
Vinyl chloride emissions	41.5 ton/yr	40.5 tons/yr
After the construction of new stripping columns		
Dry PVC production (12-month rolling total)	750,000 tons/yr	No change
Residual vinyl chloride concentrations in the resin	40 ppm	No change
Vinyl chloride emissions	30.0 tons /yr	No change

Table 2
Backup Diesel-Powered Air Compressor Potential Emissions

Pollutant	Lb/Hr	Ton/Yr
PM/PM10	1.10	0.28
CO	3.34	0.84
NO_x	15.5	3.88
SO_2	1.03	0.26
VOC	1.26	0.31

COMMENTS:
On February 26, 2003 the public notice on availability of the draft permit and supporting material for comments by persons affected by the plant was published in The Lake News in Calvert City Kentucky. The public comment period ended on March 30, 2003. During this time no comments were received from the public. U.S. EPA has 45 days to comment after receiving this proposed permit. Westlake PVC Corporation will be notified if any changes are made to the final permit based on the U.S.EPA comments.

EMISSION AND OPERATING CAPS DESCRIPTION:

PERIODIC MONITORING:

OPERATIONAL FLEXIBILITY:

COMMENTS:
This Administrative Revision was completed in order to correct multiple typographical errors and processing errors that occurred from Revision 1 to Revision 2. The two principal causes for the errors seem to stem from (1) the fact that the Draft version of Revision 1 instead of the Final version of Revision 1 was used to post the Revision 2 changes, and (2) the source comments on the Draft version of Revision 2 were logged in as a separate log number instead of as additional information to the original Revision 2 log number. As a result, it appears that the reviewer working on Revision 2 never knew source comments existed, and a proposed version of Revision 2 was issued without considering the source's comments. Four of the five comments submitted by the source on the Draft of Revision 2 addressed the administrative mistakes that occurred as a result of using the Draft version of Revision 1 as the basis for posting the Revision 2 changes, and the remaining comment was outside the scope of the requested revision. The source's comments from Revision 2 are finally addressed in Attachment A to Section IV. As a result of the extensive administrative corrections, Revision 2 was reprinted and reissued in its entirety.

Summary of changes to the permit:

- Revision 2 was reissued using the current template to reflect the final version of Revision 1.
- **Table of Contents:** Issuance dates were corrected.
- **Section B, Boilers, EP 15 and 22 (Boiler 1 and 2):** The make and model of Boilers 1 and 2 were corrected. Since Boilers 1 and 2 are identical, the controls listed for Boiler 1 were corrected from "no controls" to "low NO_X burners" (See source comment number 1).
- **Section B, Boilers, EP 15 (Boiler 1):** The annual fuel limitation was removed from Operating Limitation 1.a. for Boiler 1 (See source comment number 2), and "ethylene fuel oil or" was added to Operating Limitation 1.b. for Boiler 1.
- **Section B, Boilers, EP 22 (Boiler 2):** Operating Limitation 1.a. for Boiler 2 was revised to reflect the final version of Revision 1 (See source comment number 3).
- **Section B, Boilers, EP 15, 22, and 52 (Boilers 1, 2, and 3), Compliance Demonstration Method:** Revised wording of method c. to reflect the final version of Revision 1.
- **Section B, Boilers, page 5 of 45:** Corrected spelling of the word "discharged."
- **Section B, Dryers, page 20 of 45:** Corrected spelling of the word "manufacturer's."
- **Section B, Dryers, page 21 of 45:** Corrected the use of symbols in the PM_{10} emission rate equation.
- **Section G (d) 3, page 41 of 45:** Revised to reflect the final version of Revision 1 (See source comment number 5). Renumbered to G (d) 3 to reflect current template.
- Corrected the spelling of the word "calendar" throughout the permit.
- Corrected the spelling of the word "exceedance" throughout the permit.

Attachment A to Section IV
Source Comments, Log # 55611
(Addressed in Log # 55902)

Comments from Westlake PVC Corporation (The source comments have been retyped exactly as received March 21, 2003.)

1. **Page 3 of 46 Section B Boilers.** The name for the boilers was changed to Zurn Type-O within Revision 1, Revision 2 should read the same (Zurn Type-O).

Division Response - The division concurs with this comment and the permit has been revised.

2. **Page 3 of 46 (1.) Operating Limitations for Boiler #1 (a).** Should read the same as Revision 1 (Use of Natural/process gas as fuel shall not exceed 100,576 $ft^{\Lambda 3}$/Hr.) The annual limit 649 mm $ft^{\Lambda 3}$/Yr. should be removed per previous comments submitted for Revision 1.

Division Response - The division concurs with this comment and the permit has been revised.

3. **Page 4 of 46 Section B (A. Boilers) Boiler #2 (a).** Should read the same as Revision 1 – (use of natural gas/process gas as fuel shall not exceed 100,576 $ft^{\Lambda 3}$/Hr. if used as the sole fuel) Please refer to the draft comments submitted, approved and included for Revision 1.

Division Response - The division concurs with this comment and the permit has been revised.

4. **Page 7 of 46 Section B (Boilers) 5.** Specific record keeping requirements (C.) Calculate and maintain 1 hour average of emissions.

   The 1-hour average emission record would be a calculated number directly related to the fuel flow (which is maintained and recorded), therefore we request the 1-hour recordkeeping requirement be removed. This record retention would be a very cumbersome task with over 17,000 points gathered in a years time for filing. If the division does not agree we request the record retention limit be given serious consideration and also request a stay until the additional equipment is installed to burn the ethylene oil.

Division Response – The requested change is outside of the scope of the revisions requested with application Log # 55030, and the requested change is denied. The request can be made under a separate application which, if approved, would most likely undergo Significant Revision procedures pursuant to 401 KAR 52:020, Section 16 due to the fact that it would relax an existing recordkeeping requirement.

5. **Page 43 of 46.** Proposed commencement date was removed from the permit during Revision 1. We request Revision 2 keep the wording of Revision 1 page 43 of 48 section G (d) (4) Which states 18 months from permit issue date.

Division Response - The division concurs with this comment and the permit has been revised.